77-2-1

REPORT NO. ~~76-2-23~~

OCTOBER 1976
5230

EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS IN THE RED DIRT AREA, KISATCHIE NATIONAL FOREST

by

Daniel B. Twardus[1/]

INTRODUCTION

On October 1, 1976, a biological evaluation was conducted within the proposed Red Dirt Wilderness Area on the Kisatchie National Forest (Fig. 1). The evaluation including aerial survey and on-site examination was conducted by personnel of the Forest Pest Management Group of the U. S. Forest Service. The purpose of the evaluation was to determine the current status of the southern pine beetle population within the designated area.

METHODS

Standard aerial sketch-map procedures were used for this evaluation.[2/] Aerial survey coverage was 100 percent. Spots of dead or dying trees were recorded. Aerial survey results were corrected according to data by Aldrich *et al.* (1958) to compensate for observer error. Seven spots were examined on the ground throughout the area to determine the cause of tree mortality, number and volume of infested and affected trees, and the general condition of the beetle population.

TECHNICAL INFORMATION

Causal agent - *Dendroctonus frontalis*, Zimmerman.

Host Trees Attacked - The southern pine beetle attacks all species of southern yellow pine. On this forest, however, loblolly pine, *Pinus taeda* L., and shortleaf pine, *Pinus echinata*, are the preferred hosts.

Type of Damage - Damage caused by the southern pine beetle is tree mortality resulting from adult beetles constructing egg galleries

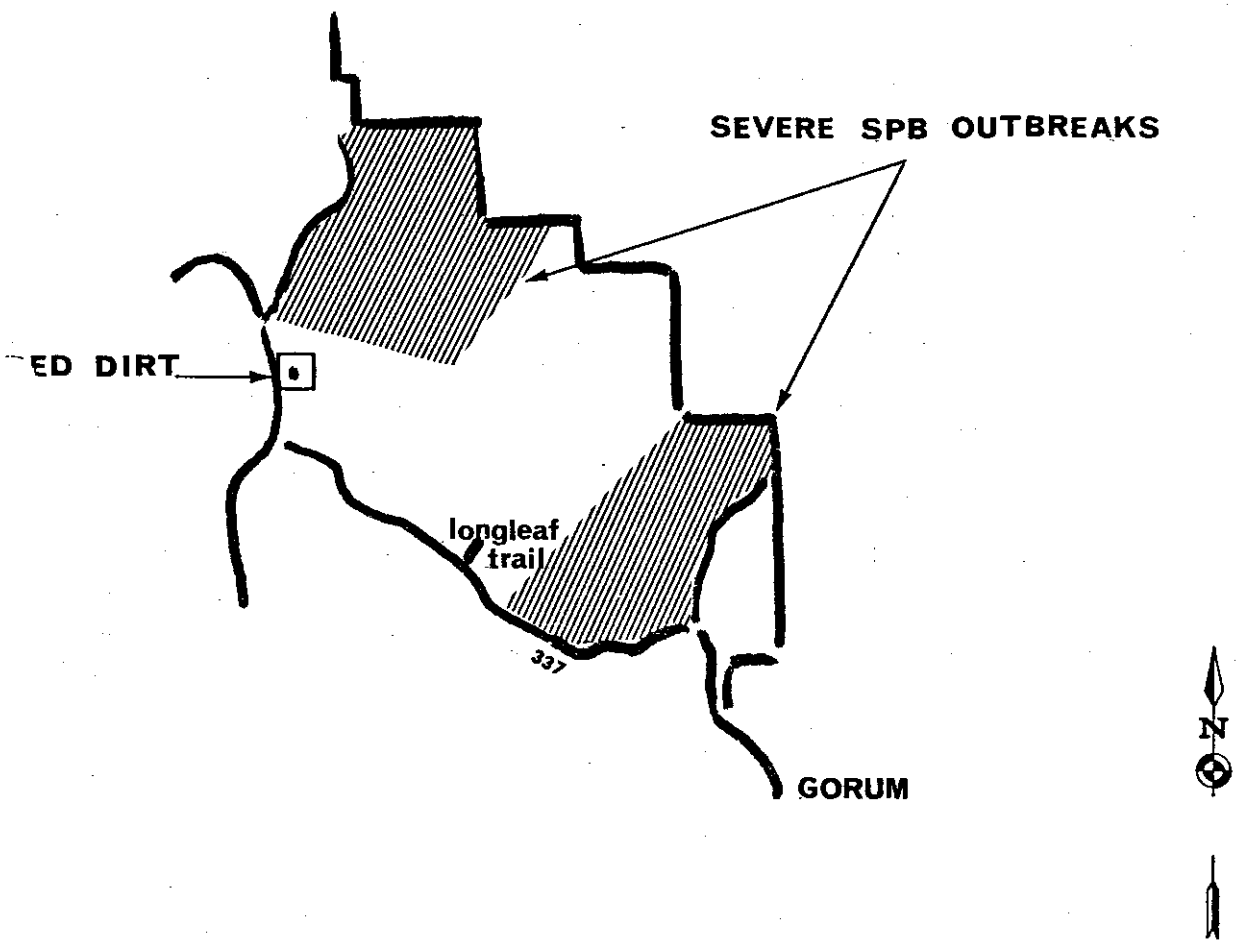
---

1/ Entomologist, U.S.F.S., Southeastern Area, State and Private Forestry, Forest Insect and Disease Mgmt. Group, Pineville, La.

2/ Detection of Forest Pests in the Southeast. 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF 7, Atlanta, Ga. 51 p.

FIGURE 1. RED DIRT AREA,

KISATCHIE NAT'L FOREST



in the cambial region of the host trees. Blue-staining fungi, *Ceratocystis* spp., introduced by the causal agent, other bark beetles and secondary insects, accelerate the kill and reduce the salvage value.

Life Cycle of the Insect - The beetles attack in pairs and construct winding egg galleries in the cambium. Eggs are deposited along the galleries. Eggs hatch into whitish grubs that further mine the cambium and then construct pupal cells in the outer bark. After transforming to adults, the beetles emerge. During the warmer months, the life cycle is completed in about 30 days. There may be as many as seven generations produced each year.

RESULTS AND DISCUSSION

Results of this evaluation are summarized in Table 1. Corrected data show that there is currently an estimated 34 spots containing 1,082.4 infested trees. Nearly all of these infestations are located in either the northern or southeastern portions of the area (Fig. 1). In these areas loblolly is the principal tree species. Scattered throughout the area are sandy ridges with longleaf being the principal tree species. No infestations were found in these areas.

The number of infested trees per M acres host type is 109.98. Infestations ranged from single trees to those with at least 200 actively infested trees. All of the infestations examined were found to have very high brood densities. Broods in many of the trees were found to be in late larval instars or in the callow adult stage. Dependent upon weather conditions, these broods may emerge within the next few weeks.

The ratio of green infested trees to red and fading trees was found to be 1.07:1. This indicates that there are at least as many green infested trees in the area as there are red and fading trees. This is of particular concern since many infestations may be present which the aerial survey did not detect.

The estimated total volume affected for the area is 99.3 MBF. Approximately 83 percent of this volume affected is found in the two large infestations located in the northern portion of the area (Fig. 1). It should be remembered that this volume affected is most likely a conservative estimate, since many green infested trees may not have been detected. This volume will also increase as the broods emerge and attack new trees.

A number of infestations located very close to private landholdings was detected by the aerial survey. Upon examination, these spots were found to be active and growing. One example was a single

Table 1. Summary of the results of the southern pine beetle evaluation conducted on the proposed Red Dirt Wilderness Area, Kisatchie N.F.

	Ownership Unit
	Kisatchie N.F. Wilderness Study Area
1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Aerial sketch map
Date of aerial survey	9/23/76
Percent survey	100%
Total acreage surveyed	10,240
Total acreage of Forest Service land	10,240
Susceptible host type acreage of Forest Service land	9,841
Total number of spots within the survey boundary	34
Total number of spots on Forest Service lands	34
Spots per M acre of host type Forest Service lands	3.429
Average spot size (trees) Forest Service lands	53
Range of spot sizes (trees) Forest Service lands	1-250
Reds and faders/M acres host type on Forest Service lands	90.0
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	10/1/76
Infested trees per M acre of host type Forest Service land	109.98
Total number of infested trees on Forest Service lands	1,082.4
Total volume of infested trees on Forest Service lands	98.14 MBF
Total number of affected trees on Forest Service lands	1,094.98
Total volume of affected trees on Forest Service lands	99.32 MBF
Ratio of green infested to total red and fading trees	1.07:1

Volume - BF - based on Scribner decimal C log rule. Cords converted to bd. ft. based on 500 bd. ft. per cord.

red-topped tree detected by the aerial survey and located approximately 75 yards from private land. Examination on the ground found the red-top to be a lightning-struck tree which subsequently incurred SPB attack. In addition, approximately 80 green-infested trees were present. This illustration points to the particularly high SPB populations present in the area, though they may not be readily apparent through the detection of red-topped or fading trees.

RECOMMENDATIONS

1. The present situation in the proposed Red Dirt Wilderness Area represents an opportune time to effectively reduce SPB populations. The preponderance of green, recently infested trees surrounding red-topped trees in which the brood has recently emerged, indicates the tendency for spot expansion rather than spot proliferation. With the onset of lower autumn temperatures, many of these green-infested trees will serve as overwintering sites for the broods. Consequently, rapid salvage removal at this time may serve to effectively reduce this overwintering population.

2. Concentrate control efforts initially on the two large spots located in the northern section. Of the total green-infested trees examined during the evaluation, 72 percent were located in these areas. In carrying out salvage removal, start with the green-infested trees, then remove the infested red-tops and faders, and finally the green buffer strip trees. Examination of the spots showed that only about 9 percent of the red-topped and fading trees were still infested, hence salvage removal of these can be delayed.

3. All fading and red-topped trees detected during an aerial survey should also be examined on the ground. Many spots which may appear to have only one or a few affected trees will actually have large numbers of green-infested trees.

4. If control is to be effective (i.e. to prevent further emergence), it should begin within two to three weeks of the date of this evaluation.

5. All control efforts should be carried out in accordance with guidelines set forth in FSM 5250, SA Supplement No. 8. The local Louisiana Forestry Commission Office should be advised of the beetle status and spot location on intermingled private lands within the forest protection boundary.

REFERENCES

1. Aldrich, R. C., R. C. Heller and W. F. Bailey. 1958. Observation limits for aerial sketch mapping southern pine beetle damage in the southern Appalachians. J. For. 56(3):200-203.